TELEPRODOTTI STORE

SIMPLY ONE

Audio analogic interface "all in one" for audio measures and loudspeakers parameters Thiele & Small

-USER 'S MANUAL-

KIT SIMPLY ONE

Audio analogic interface for measures and parameters loudspeakers Thiele & Small
tested with following the software:

Audiotester http://www.audiotester.de/ **Arta** http://www.fesb.hr/~mateljan/arta/

Room EQ Witzard http://www.hometheatershack.com/roomeq/

DSSF3 http://www.ymec.com/products/dssf3e/index.htm

Visual Analyser http://www.sillanumsoft.org/Italiano/index.htm

Daqarta http://www.daqarta.com/ **Loudspeaker lab3** http://www.lsp-lab.com/Downloads.htm

PREFACE

Thank to you for purchaising the kit SIMPY ONE, we hope it will become your valid instrument with which ,You will be able to realize, to test, to measure and to refinish your acoustic box and loudspeakers
It was our intent to supply complete product "all in one ", simple and compact product, enormously functional to low price for the capacity of everyone, professionists and hobbyists
Our idea to realize this kit is born because now there are many software for measures audio with very low price and, they have performance and precision very hight, simultaneously, from the performance of the current sound cards that can offer of the best features with the possibility to obtain given of AUDIO survey of class 1!
The interface was experienced and tested with success on most numerous amateurish and professional sound cards , for our interface becomes insignificant the IN/OUT impedance of Your sound card because our interface has a buffer out finalized to cancel this annoying variable often, this has been source of failure in the realization of "passive interfaces" , to such purpose, for to the quality of the measures is clearly preferable that your sound card has at least frequency of sampling to 96Khz

One other important parameter for sound card is the time latency, the professional soundcards for recording are supplied with own driver ASIO, this allows to obtain low latencies stable into time domain

If you will use amateurish cards used for the audio reproduction, (home theatre ,HiFi,Games, and so on..) we recommend to You warmly switch off all effects DSP, equalizers, etc…in the pannel control of your soundcard

The gain and the levels of the interface are optimized so as to be able to work in way adapted with all the sound cards in circulation also with those basic ones (integrated on the card mother of the PC) is only necessary that they have a input LINE or AUX and are "fullduplex" (recording and playback simultaneously)

The content into the Kit Simply One

1	2	3
4	5	6
7	8	9

1. Interface SIMPLY ONE

2. Calibrated microphone serialized from 10Hz to 20000Hz +/- 0,6 db SPL max. 134db

3. Pocket Weighing Scale 0-500g (enclosed batteries)

4. Calibrator for microphone SPL 94db 1000Hz

5. Calibration cart and CD contenent the calibration microphone file and the manuals in PDF format
6. Cable of output power with connectors to banana 4mm. length 120cm.

7. Microphone cable (low capacity) length 5mt.

8. Clamp support for microphone with adapter

9. Two cables IN/OUT interface to sound card length 120cm.

Short description of operation of the device and its connections to the audio card of the PC

Although there are many software with diversified setup, the operation principle are like for all

Substantially our interface it is subdivided in the two modalities of use , we will examine to this point the two modalities
modality **FREQUENCY RESPONSE** and modality I**MPEDANCE**.

1) **FREQUENCY RESPONSE**: In this modality a microphone is used in order to capture the produced sonorous waves from the diffuser under test, a signal generator integrated in the software, send the signal into power amplifier suitable for load at low impedance (from about 2 ohm)

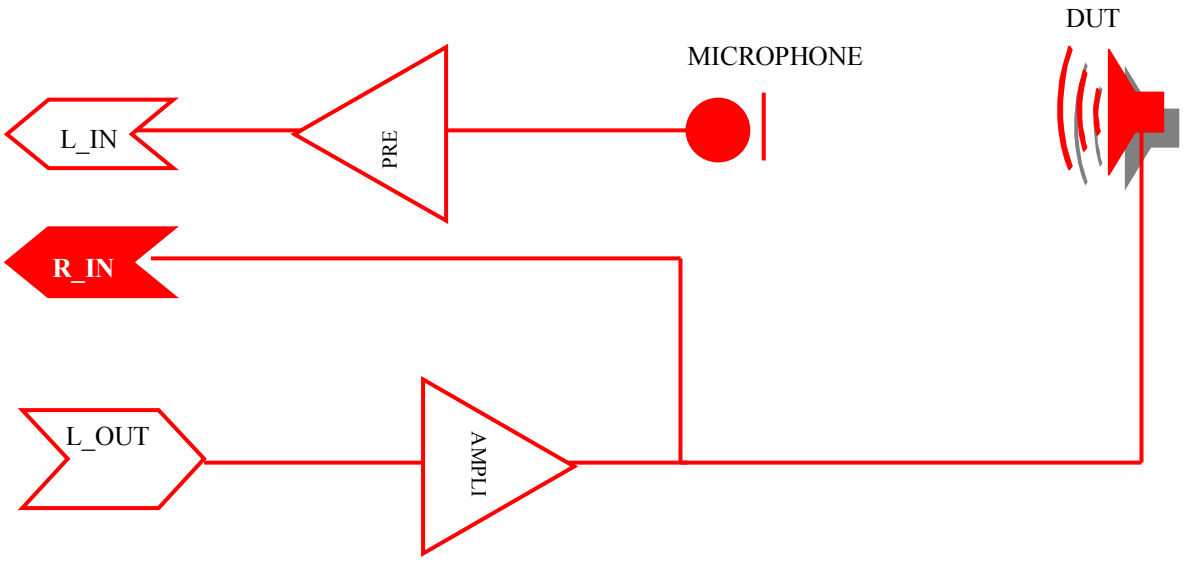
The operation mechanism is the following one: the microphone receives the signal that is sent to a preamplifier that amplify the too low signal, the output of this preamplifier is connected at channel LEFT INPUT of your audio card (see pag3) So,therefore we can assert that
INPUT LEFT is used for the INPUT of the signal to analyze

The signal of the present generator of functions inside the software is available on OUTPUT LEFT of your audio card, comes therefore sent to an power amplifier of to whose exited there is connected the acoustic system under examination , (see pag3)
With everything said until now ,we can see that:

INPUT LEFT OF THE AUDIO CARD IS USED FOR INPUT SIGNAL
OUTPUT LEFT IS USED FOR OUTPUT SIGNAL TO POWER AMPLIFIER CONNECTED TO DUT UNDER TEST

With the device so connected, we have the **frequency response from single channel**

To linearize the signal in order to obtain an extremely precise measurement and compensated for frequency and level, is used, the INPUT RIGHT channel as a reference "REFERENCE CH" of the signal taken from the output of the power amplifier (see follw pic)



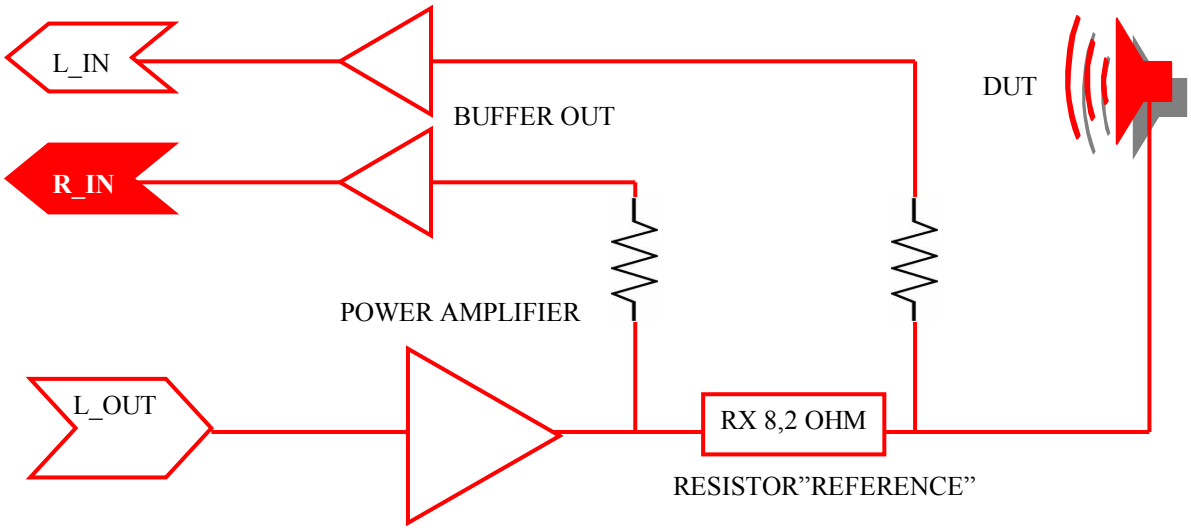
Summarizing what told until now, about the FREQUENCY RESPONSE modality is apparent that:

LEFT input receives the signal from the microphone preamplifier
RIGHT input picks up the output signal of, power amplifier for comparing parameters
LEFT output provides the signal for power amplifier.

METHOD OF OPERATION under modality "IMPEDANCE" (2)

IMPEDANCE modality in our interface allows us to obtain the parameters T.S. for loudspeaker reading the impedance variations in relation to the frequency, with this way allows us to obtain the GRAPHIC IMPEDANCE , useful to obtain the basic parameters of the loudspeakers under test.

The system is based on the potential difference generated from resistor of known value (RX) put in series to the transducer to be analyzed, in brief, it will read the potential difference which will be created as a result of voltage drop on the RX, all be compared with the frequency at which undergoes the test.
From what has been described until now, we can deduced that :
The two inputs of your sound card LEFT and RIGHT will be connected with the resistor "RX REFERENCE" so to read the two voltage values that are obtained when the resistor is connected in series with the load under test.

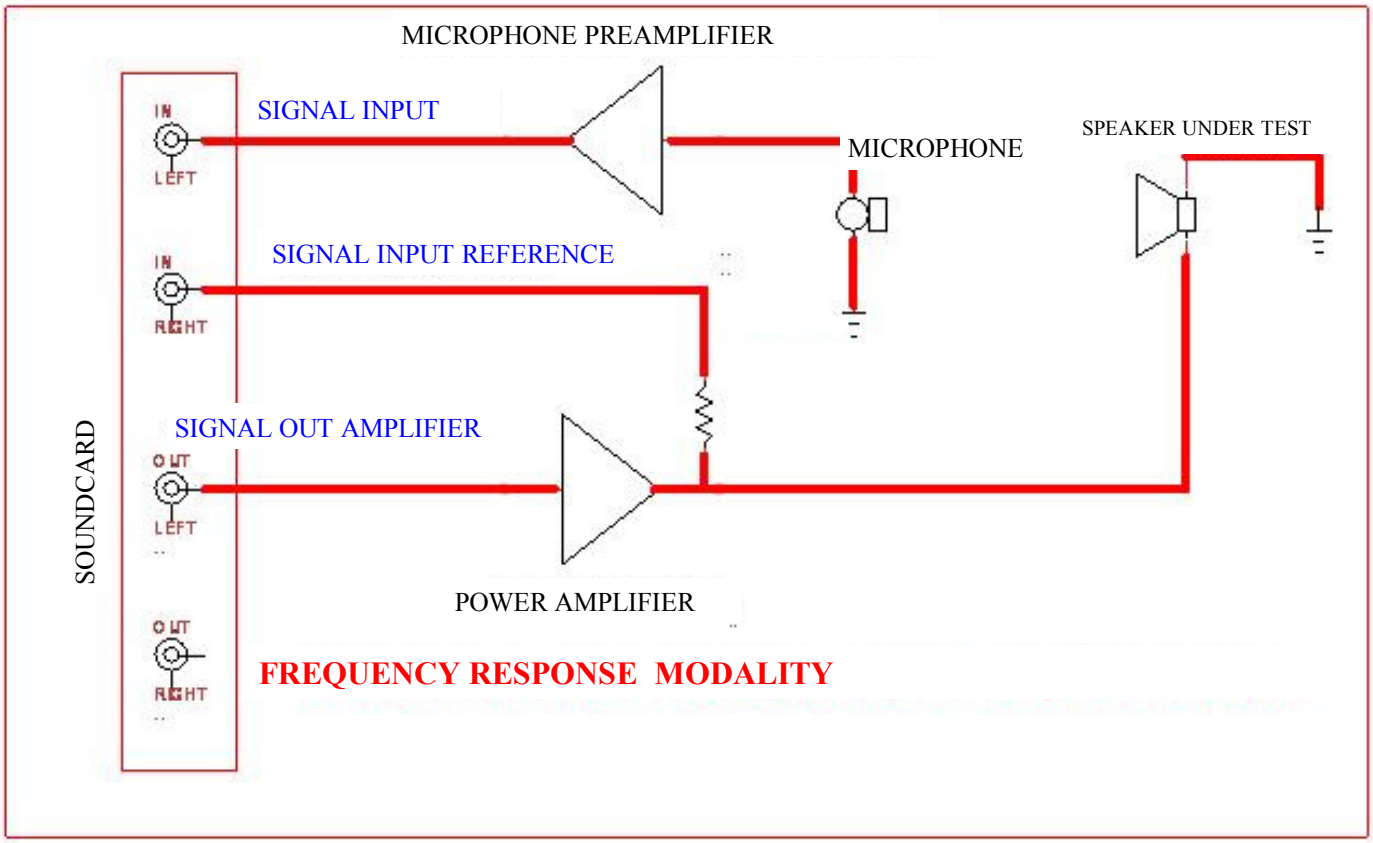


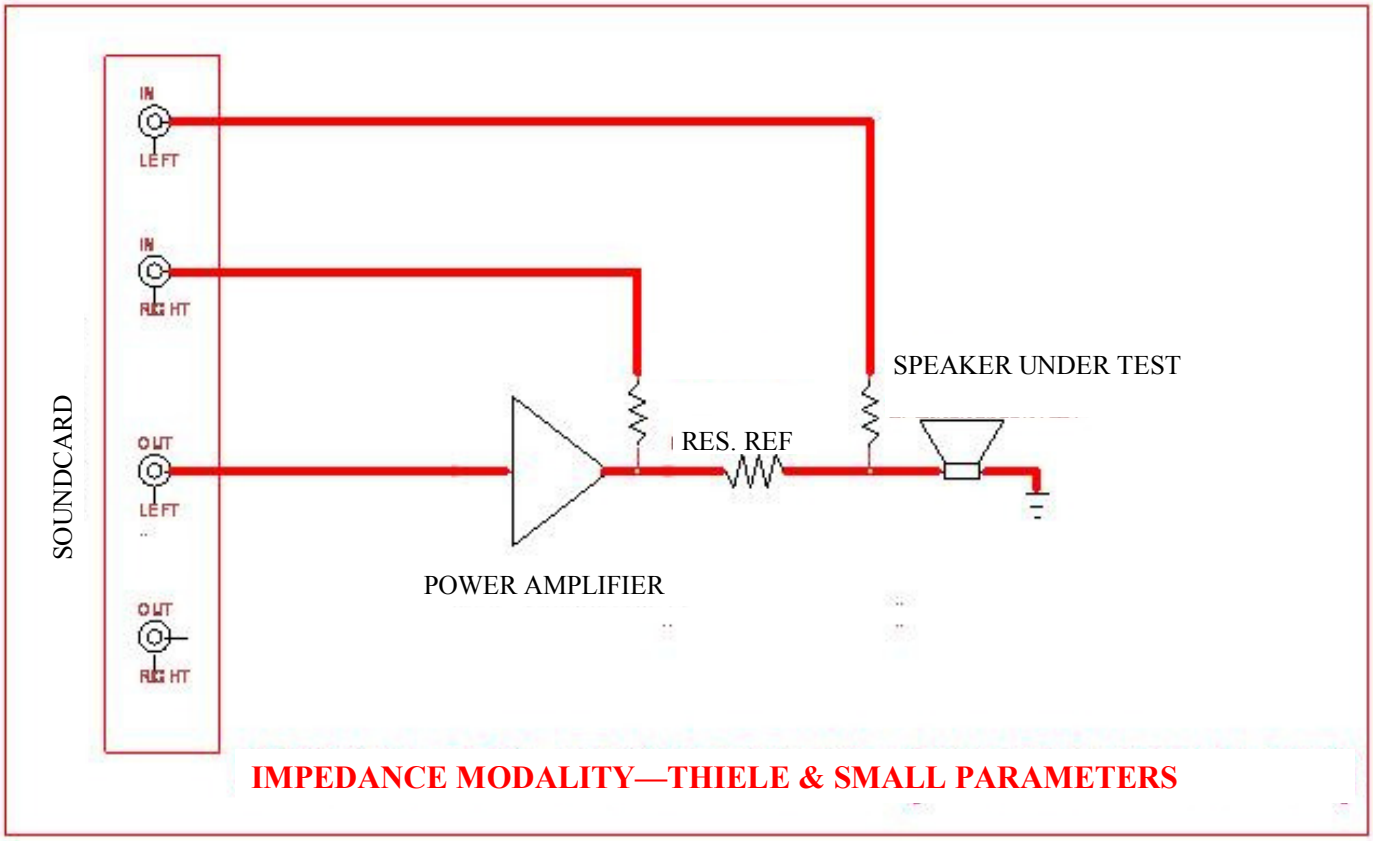
THE VALUE OF REFERENCE RESISTOR IS 8,2 OHM, THIS VALUE WILL BE ASKED DURING THE SETUP TO YOUR SOFTWARE

WHEN YOU MAKE THE PROCEDURE FOR CALIBRATION,PLEASE, REFER TO THE INSTRUCTIONS IN THE MANUALS OF SOFTWARE USED

SIMPLIFIED DIAGRAM SHOWING THE INTERFACE IN TWO OPERATING MODE 'OF OPERATION : FREQUENCY and IMPEDANCE

1) FREQUENCY RESPONSE
2) IMPEDANCE (PARAMETRI T.S.)

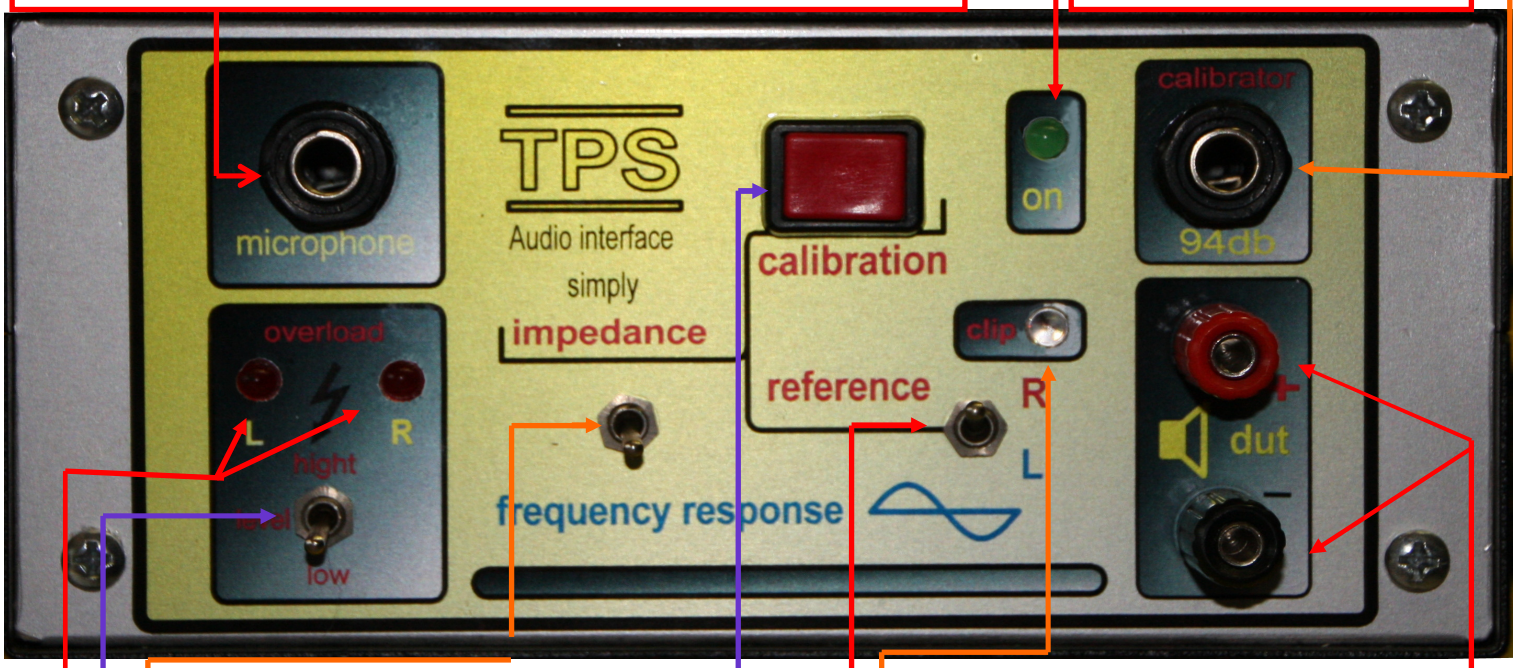




Calibrator output 94dB SPL 1000Hz, provides a sinusoidal signal to 94 dB SPL TO 1Khz , useful to calibrate the precise measurement of the sound pressure

Microphone in-power "negative bias" -8.2 V dc input Impedance 10Kohm, sensitivity 5-30 mV / pa

"power on" supply



Loudspeaker or speaker under test, the load impedance can be from 2 to 32 ohms, the output power: is (14W 2-4 ohms) (7W 8 ohm) (4w 16 ohm) 10-40 khz response TDH max 0.5%

THE light red LED indicates the clipping of the amplifier built into the interface, its intervention is at about 70% of undistorted power available from the power amplifier

The switch provides to assign the function reference to LEFT or RIGHT channel input mode of operation IMPEDANCE Interface, many software have the ability to set the parameter through the setup, if that is not possible, using this switch you can choose the channel "reference". This feature is only for use in IMPEDANCE mode interface.

This button is used onlyf or the calibration of the software when you using the impedance mode to make the detection of TS parameters of the speakers. Hold down the button when you calibrate (reference resistor), releasing it only completed calibration.
In this regard, please note that you will need to calibrate arrange the switch frequency response-position Impedance IMPEDANCE

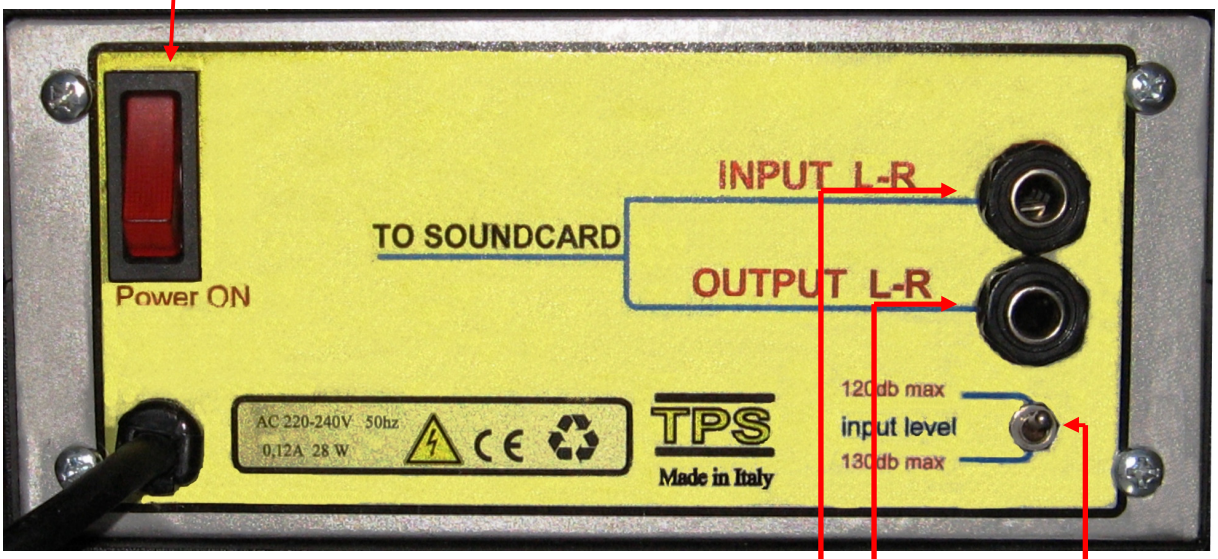
The switch prepares the device to two basic modes of operation:
frequency response,refers to the measurement of frequency and all measurements made by microphone to the speaker or the speaker under-test,example, spectrum analyzer, frequency response, TDH, etc. ....
Impedance refers to the detection of small and Thiele loudspeaker under test. (for all other transactions with microphone detection of the switch should be to position "frequency response"

This switch provides to further increase the attenuation factor "ratio" of the divider connected to the output amplifier built about 10 db in the "low", may be useful to test your speakers using the built-in amplifier to interface full capacity without risking signal saturation all'inresso sound card.

These two LEDS indicate power protection of the input signal for the soundcard, in case of light , reduce the signal at the mixer-soundcard or, in case of microphone detection SPL above 120 db set the position the switch on the back of the interface in position 130dB

BACK OF 'INTERFACE AND CONNECTIONS

power on



IT CONNECTS TO AUX INPUT SOUNDCARD, THE CONNECTION HAS TWO CHANNELS LEFTAND RIGHT. CAREFUL not to confuse them, LEFT IS ALWAYS THE CENTRAL PIN

THIS SWITCH ALLOWS TO SET THE MAXIMUM MICROPHONE LEVEL OF SPL :
UNTIL 120 DB
AND FROM 120 TO 134DB MAX,

IT CONNECTS AUDIO OUTPUT SOUND CARD, SHOULD BE CONNECTED ONLY THE LEFT CHANNEL (CENTRAL PIN)

MICROPHONE INPUT CONNECTION
THE CONNECTION USES ONLY TWO POLES (GROUND) AND (SIGNAL)

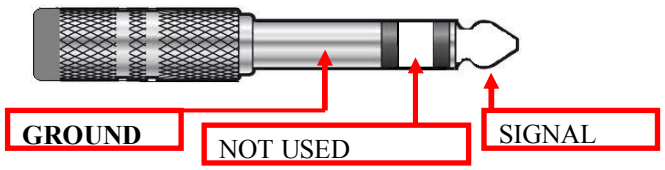
CALIBRATOR SPL 94db 1Khz

The calibrator integrated interface allows us to have a constant frequency sound pressure of known value in order to precisely adjust the microphone gain, allows us to significantly increase the degree of accuracy in measurements of SPL, drastically reducing the effects due to the thermal coefficient of the microphone itself, bringing the measurement accuracy of + / - 0.4 db in a temperature range of 0-48 degrees centigrade.
Furthermore, it is very convenient to make the setup of some software that does not require data entry on the sensitivity of the microphone and preamplifier gain, because they require you to submit the microphone at a sound pressure level known to calibrate the measurement system .
In order to obtain a precise calibration in lowest terms it is recommended to perform a preheating of the calibrator of about 5 minutes before performing the measurement. To do this, simply insert the plug into the socket of the transducer .

The transducer calibrator has a cable connection with a meter in length ,in order to make easier the placing on the microphone

Electrical connections:
The output of the microphone has a connector pin 3 1/4 "UNBALANCED mode (TWO-POLE CONNECTED SIGNAL AND GROUND)

ELECTRICAL CONNECTION FOR OUTPUT CALIBRATOR

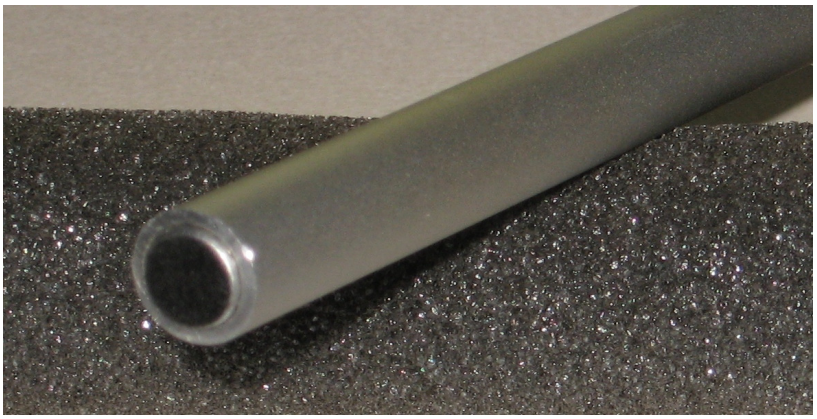


The calibrator is made functional by the insertion of the plug interface, it causes the activation of the oscillator . It is recommended that to connect the transducer only during the calibration phase, and disconnect it during the measurements.
In the following pages of the manual you will find some examples of using it into setup for ARTA. software

Please keep the transducer of the calibrator in a clean dry place, when not in use, it is recommended to cover its opening with the cap provided with the foam protection

THE MICROPHONE W61LK

The microphone supplied with the kit (W61LK) was specifically designed to perform acoustic measurements, made with Panasonic capsules modified to significantly reduce distortion at high sound pressure levels, the frequency range is 10Hz to 25kHz, the microphone is built with an aluminum stylus anodized, has a 3-pin connector output for canon connect the cable to the interface, the microphone comes with a unique serial which is connected to the calibration file TXT (10Hz to 20Khz) that is supplied with the microphone on CD.
In the calibration file that allows to obtain a precision 10Hz-20KHz + / - 0.6 db is present, the figure relating to the sensitivity expressed in mv / PA.
Please note that the timing of our microphone is NOT INVERTING



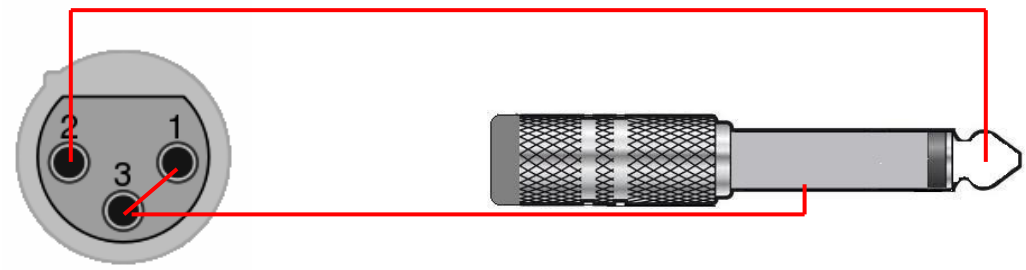
The capsule is mounted on top of the stylus without any aluminum grid, we have verified by numerous tests conducted in our laboratory that allows for no shades on the performance of high frequency (10-25KHz) and especially more stable over time, from various commercial testing of microphones fitted with metal mesh grilles we later found their vulnerability to small deformations that inevitably suffer during use and that provide for altering the phase response and sometimes even significantly

Electrical connections:

The output of the microphone has a canon 3 poles connected via UNBALANCED (TWO PINS– SIGNAL AND GROUND)

MICROPHONE CONNECTIONS

CABLE CONNECTIONS



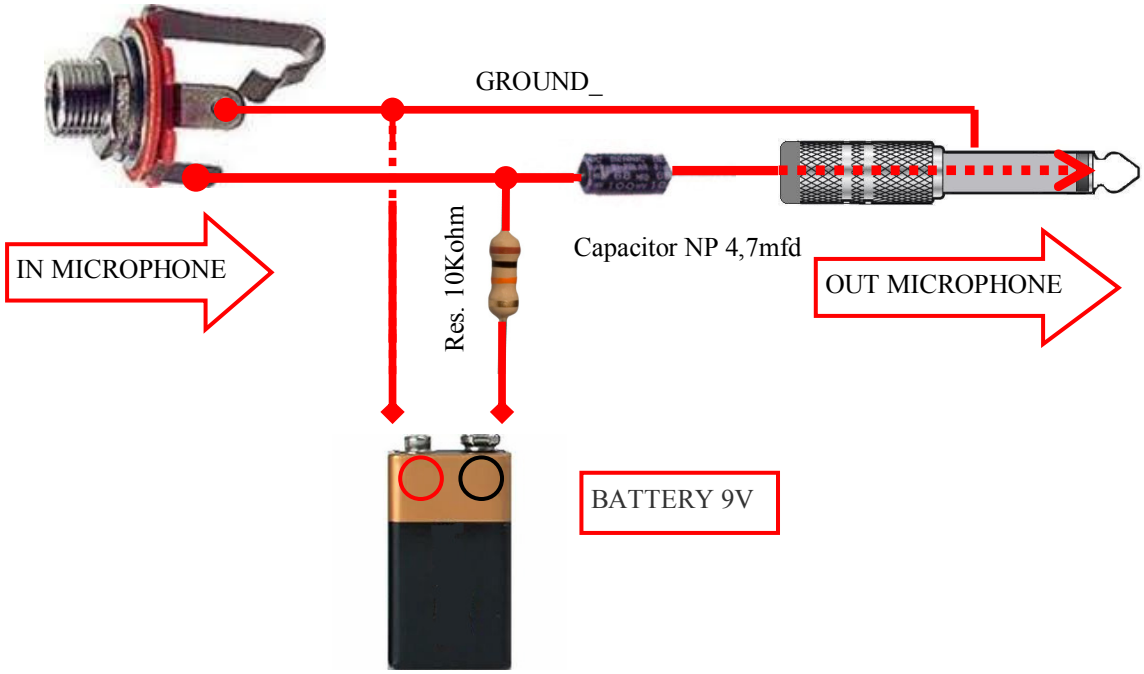
Using the microphone with other equipments

In order to use our microphones on any device other than our interface SIMPLY that already serves the purpose of providing power bias you will have to make a very simple circuit capable of providing power to the microphone and, consequently, to decouple the output of the microphone .
The following shows the schematic needed to using our microphone to any microphone input ,(also phantom powered)
WE RECOMMEND THAT YOU PUT ALL IN A metal box to avoid unwanted noises
The scheme is very simply to realize with only two components:

A RESISTOR A 1/4 WATT -VALUE 10KOHM

A BIPOLAR CAPACITOR 4.7 MFD 50VOLT

NEED A BATTERY 9 VOLT for supply power to capsule into microphone



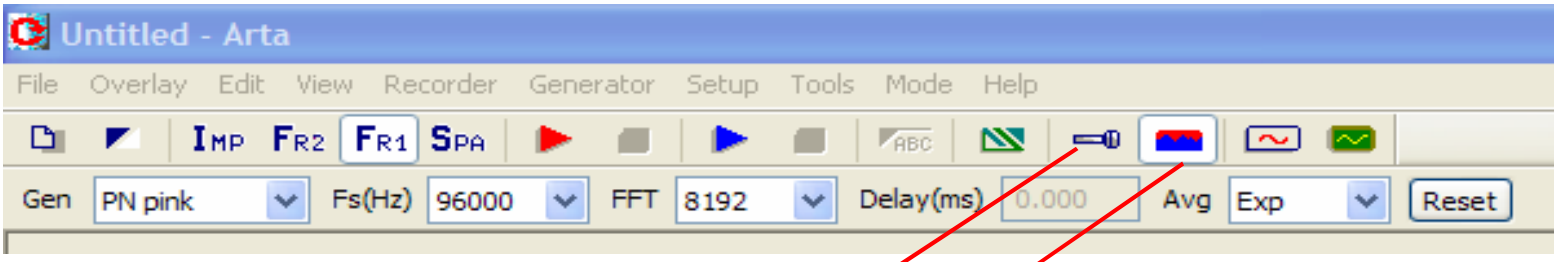
EXAMPLE SETUP FOR SOFTWARE ARTA_LIMP_STEPS

Now we show you how to enter the parameters needed to run the interface in the ARTA SOFTWARE setup, one of the best software for comprehensive, reasonable cost and use very intuitive.
Il sofware Arta è diviso in tre sostaznziali software diversificato per funzioni:

1) ARTA with analysis of pulse, frequency response, spectrum analyzer, and so on ..
2) LIMP is the section of ARTA inherent in the impedance measurement (TS parameters for loudspeakers)
3) STEPS is the section of the program that uses pulse frequency progressive steps, the SETUP is the same as that used by ARTA section

then will be replicated for the STEPS setup so, we will limit our explain of the parameters for the setup in ARTA and LIMP.

Click on ARTA and will open the main screen in the top left corner you will find the toolbar (see picture below), set the parameters as in the picture , following the instructions included in the same picture


Untitled - Arta
File Overlay Edit View Recorder Generator Setup Tools Mode Help
IMP FR2 FR1 SPA
Gen PN pink Fs(Hz) 96000 FFT 8192 Delay(ms) 0.000 Avg Exp Reset

SETUP audio device, follow these steps:

1

2

SETUP to enter the calibration file of the microphone. Follow the indications for calibration microphone that you can find it later.

Clicking on the Ref 1 leads to the audio device setup, and you will see the following screen:

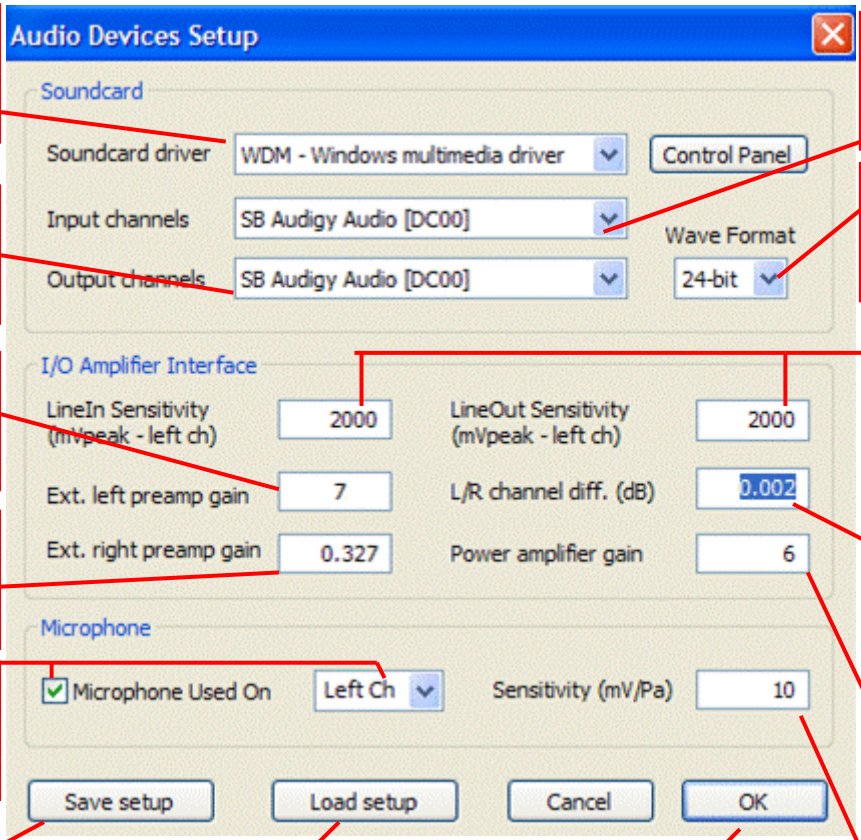
Put the driver of sound card you intend to use the software

Specify which outputs to use in case your sheda has multiple outputs

Preamplifier gain must be set at 7.00 for our interface

Factor ratio reference channel right. Must be set at 0,327 for our interface

Set on the tick on the microphone, and set the sliding window of LEFTch as in photos



Specify the inputs you intend to use with your sound card

Set this parameter by virtue of the characteristics of the sound card 16/24 / 32bit

Consult the input parameters and output of your sound card, can vary from 1 to 2 volts

Gain difference L / R audio card, you may obtain it by using software MARK RIGHT analyzer

Voltage gain of the amplifier must be set to 6 for our interface

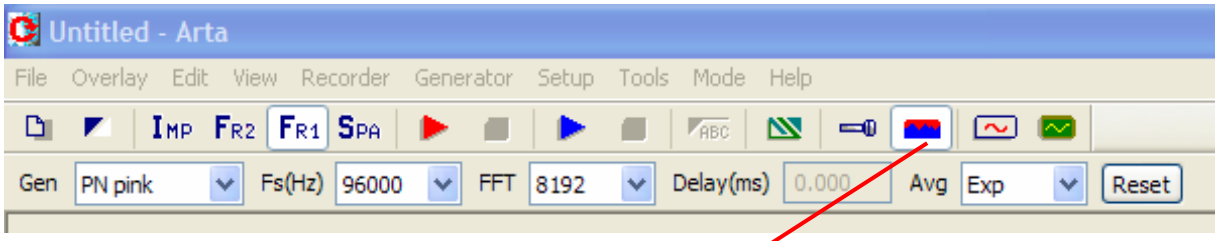
Press this button at the end of the complete data by assigning it a name of your choice

Used to retrieve a previously saved setup

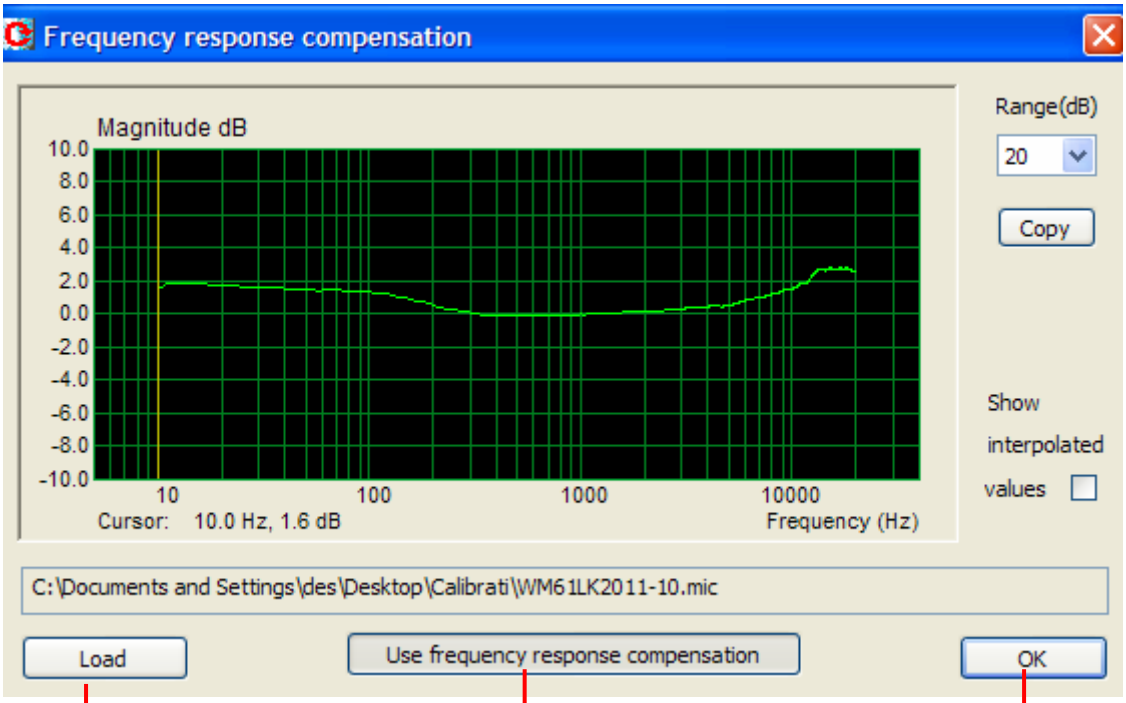
Press ok to operationalize the setup just set up

write the sensitivity of the microphone you will find in the first line of the txt files calibration, is expressed in mV at 94 db or mv / Pa

Step2—MICROPHONE CALIBRATION DATA ENTRY INTO ARTA AND ARTA STEPS


Untitled - Arta
File Overlay Edit View Recorder Generator Setup Tools Mode Help
IMP FR2 FR1 SPA
Gen PN pink Fs(Hz) 96000 FFT 8192 Delay(ms) 0.000 Avg Exp Reset

CLICK ON THIS ICON IN THIS TOOLBAR OF ARTA ARTA and STEPS;
THE NEXT SCREEN WILL GET LIKELY TO PUT THE MICROPHONE CALIBRATION FILES

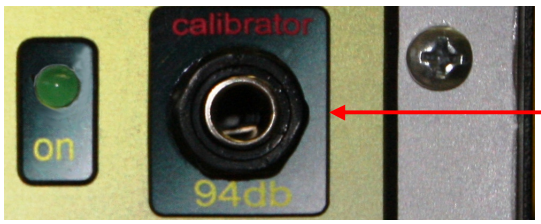


STEP 1:
PRESS THE LOAD to load the calibration file, in this connection, rename the file changing the e-xtension from .TXT to .MIC (for ARTA only)

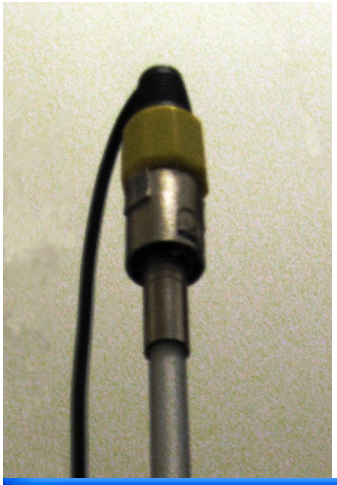
STEP 2.
CLICK THIS BUTTON to operationa-lize the calibration, the calibration quabdo is on the button takes on a dar-ker color as picture if you ripreme the key takes a light color, in this case the program will not use the comparison

PRESS OK to confirm and close the screen.

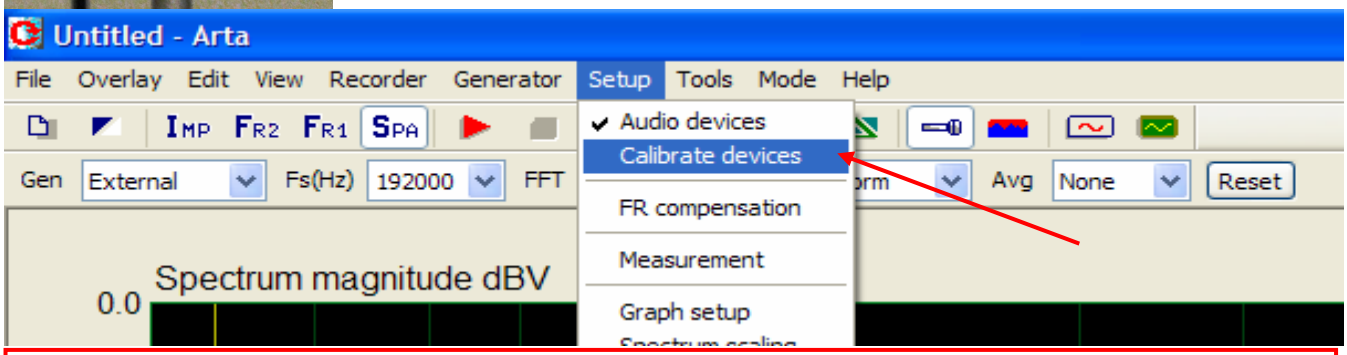
CALIBRATION SPL WITH CALIBRATOR 94db



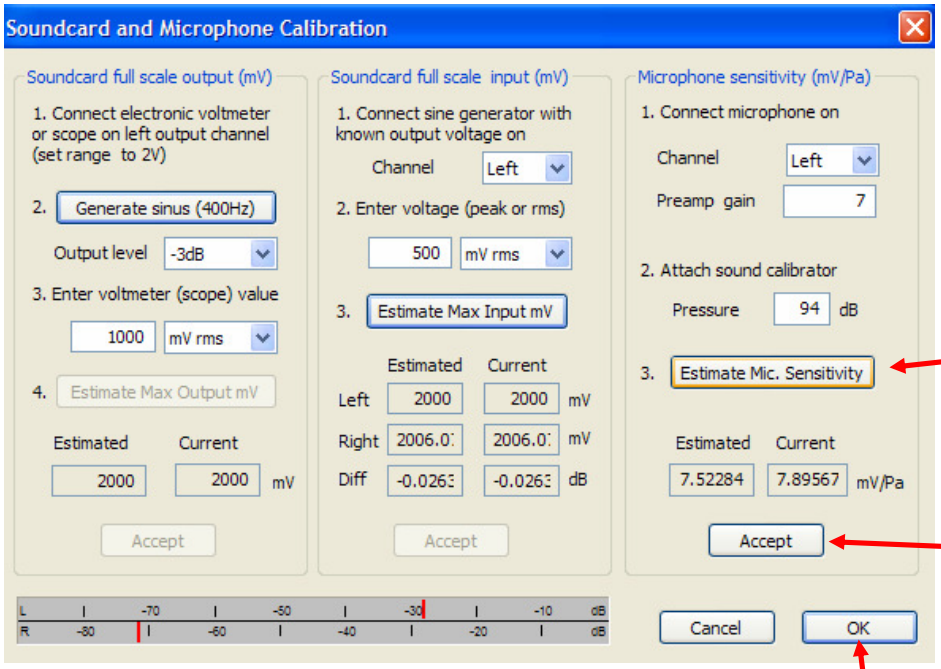
CONNECT THE TRANSDUCER TOINTERFACE



Holding the MICROPHONE IN VERTICAL POSITION, THE STICK ON TRANSDUCER CALIBRATION OF THE MICROPHONE, NOT 'NEED TO PRESS THE MICROPHONE, IS SUFFICIENT FORCE EXERCISED BY WEIGHT OF TRANSDUCER TO ENSURE THE CORRECT PRESSURE.
DURING THE CALIBRATION AVOID SHOCK TO MICROPHONE, BECAUSE IT COULD GENERATE INFRASONIC NOISE AND CAN VOID THE MEASURE..
IF YOU HAVE A MICROPHONE STAND WILL BE MORE EASY OPERATION IN FIXING THE MICROPHONE TO VERTICAL POSITION.
AT THIS POINT, CLICK ON THE MENU 'A DESCENT "SETUP" IN THE TOOLBAR OF ARTA, CLICK AGAIN ON "CALIBRATE DEVICES", (SHOWN IN THE PHOTO BELOW)



CLICKING ON "CALIBRATE DEVICES", WILL APPEAR NEXT SCREEN ..



STEP 1

CLICK ON THE BUTTON "ESTIMATE MIC.SENSITIVITY"

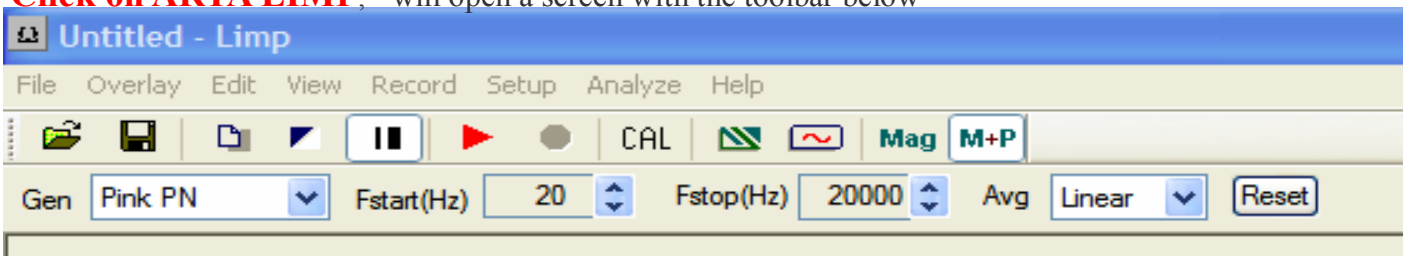
STEP 2

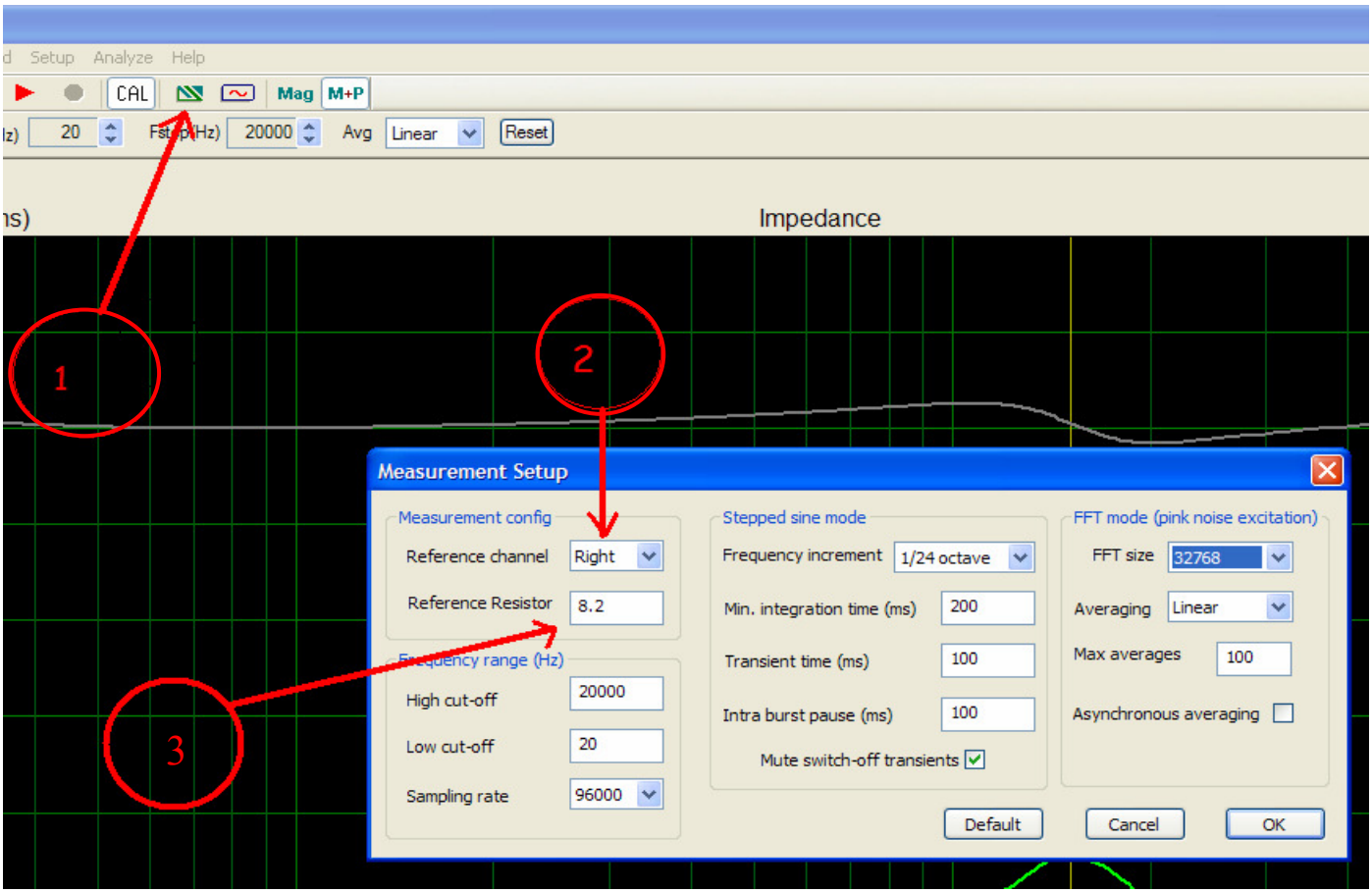
WAIT FOR THE END OF PROCEDURE, AFTER,PRESS ACCEPT THE RECORD FOR NEW VALUE OBTAINED

PRESS OK FOR CLOSING THE WINDOW AND RETURN TO PROGRAM

SETUP for ARTA_LIMP (PARAMETER THIELE and SMALL)

Click on ARTA LIMP, will open a screen with the toolbar below





1) Click the icon depicted in the previous photography and marked with reference number 1 Will appear the window measurement setup as in figure

2) Set the channel **REFERENCE RIGHT** simultaneously providing to set in our interface **REFERENCE RIGHT**(toggle switch on the right).

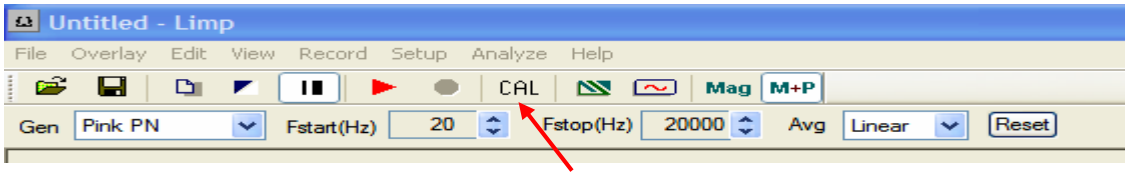
3) SET **VALUE OF RESISTOR REFERENCE to 8.2 OHM**

The input values allow it to calibrate the device LIMP for detecting the impedance curve of the speakers in the test

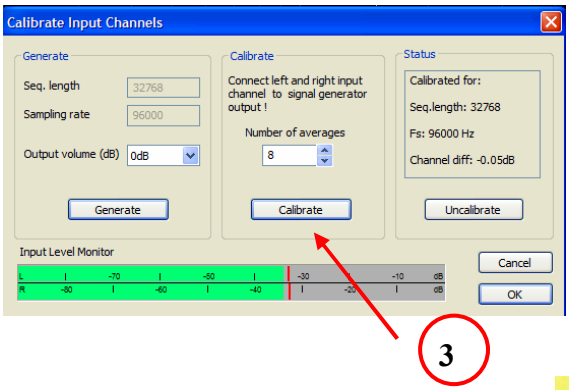
SETUP_LIMP (THIELE- SMALL PARAMETS) CALIBRATION

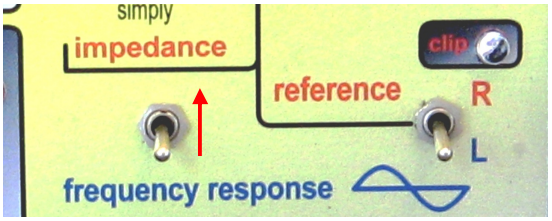
We arrived at the last step ,the calibration program ARTA LIMP, in brief, short-circuit the resistor "reference" giving way to calibrate any differences between the channels used LEFT RIGHT across the resistor during the analysis process.

1) Start the program ARTA-LIMP. There appear on the toolbar at the top as to next picture :



2) Click on the CAL button, you will see the following screen, simultaneously, be sure to set the interface to modality **IMPEDANCE**





3) PRESS "CALIBRATION" " see picture to right" and simultaneously, without leaving it, click on the button "calibrated" see in the "pics above (3)" release the red button to interface just after calibration , when in the "status "read a message like the one pictured above.

VERY IMPORTANT! The described process is performed with the DUT connected to interface

Well, we arrived at the end to our setup, everything is ready for use, we recommend that you print the manuals included with software used because they are of substantial importance for use in the best way to learn and especially to make full use of all the many features ...

Please verify that the computer is used that the interface are connected to a ground system (as is the case for all electrical equipment in metal), this is for the functionality (as doing so is reset to zero the potential difference which might created between the two sets) and for your safety.

SPECIFICATION
SIMPLY ONE INTERFACE

SUPPLY 220-240Vac 50 HZ
POWER MAX. 28W

designed and made by **Teleprodotti Store** www.teleprodottistore.it

PREAMPLIFIER:

GAIN VOLTS **7 16.9 db** (-22db with switch positioned to 130db)

INPUT MIC 5-30 mv WITH BIAS SUPPLY NEGATIV –8,2V cc (MIC01LK)
FREQUENCY RESPONSE 10Hz-50Khz

POWER AMPLIFIER:
POWER 14Wrms 4 ohm—7Wrms 8 ohm
TDH max 1khz 0,5%
FREQUENCY RESPONSE 10hz 40Khz +/- 0,2db
GAIN VOLTS **6 15.56 db**
CLIPPING INDICATOR (70%) of POWER max

SECTION OF SWITCHING FREQUENCY

FADE OUT (RATIO CH RIGHT) (POSITION HIGHT) **0.3276**
FADE OUT (RATIO CH RIGHT) (POSITION LOW) **0.1268**
OUTPUT IMPEDANCE < 500 ohm
limiter output signal 1.8V rms

SECTION OF SWITCHING IMPEDANCE

RESISTOR REFERENCE RX **8.2 ohm**
OUTPUT IMPEDANCE < 500 ohm
limiter output signal 1.8V rms

CALIBRATOR SPL
FREQUENCY 1000HZ
ACOUSTIC PRESSURE 94 db SPL
TDH < 0.5%
PRECISION +/- 0.3db
TEMPERATURE REFERENCE 22 degree 1018 mb pressure barometrica 0mt SLM
ALTITUDE EFFECT —0.1 db to 500mt SLM

CASE OF IRON, covers in black epoxy paint, aluminum fronts.
DIMENSIONS 180mm x 80mm x150mm
WEIGHT 1,8 KG

WARNING! IS PROHIBITED THE PARTIAL REPRODUCTION OF IMAGES AND TEXTS OF THIS CATALOGUE WITHOUT THE EXPRESS PERMISSION OF THE AUTHOR

Copyright © TELEPRODOTTI STORE 2011-2012